9 March 1966
Ref: LJC 406-1840

Post Office Box 6788
Fort Davis Station
Washington, D. C. 20020

25X1A

Attention:

Contracting Officer

25X1A

Subject:
25X1A

ECP-136-1

Gentlemen: 25X1A

In response to a request by your Technical Representative ▮▮▮▮▮▮,
we are submitting herewith an Engineering Change Proposal (ECP-136-1) to in-
corporate certain electrical and mechanical features into the 70mm Data Block
Reader being developed and fabricated for you under the subject contract.

Enclosed herewith are three (3) copies of a technical document which
describes in detail those wander corrections (electrical) and operator efficiency
(mechanical) features which would be incorporated into this Data Block Reader.
25X1A   Also included herewith are three (3) copies of a ▮▮▮▮ Cost Breakdown Work-
25X1A   sheet in the total amount of ▮▮▮▮.

Since delivery of the end item Data Block Reader is on schedule and will
be accomplished by 30 April 1966, it is necessary that the contract be amended to
authorize these technical changes at the earliest possible date.

We trust that this Engineering Change Proposal and the cost data associated
with these changes as submitted herewith are complete for your evaluation. How-
ever, if any additional information is required, please feel free to contact me.

Very truly yours,

ORIGINAL SIGNED BY

25X1A

Contracts

avw
Encs.

25X1A   cc:

P. O. Box 8031
Southwest Station
Washington, D. C. 20024

Next 1 Page(s) In Document Exempt
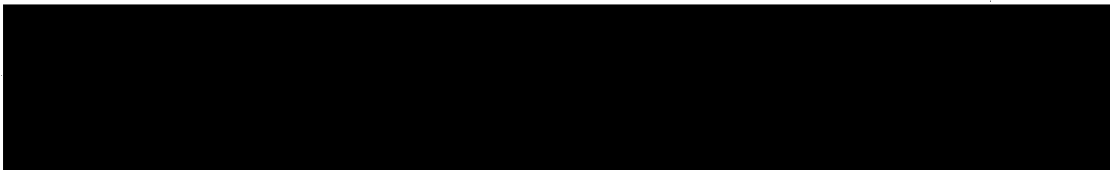
ECP-136-1

Engineering Change Proposal

STATINTL

70MM DATA BLOCK READER

STATINTL

Prepared By
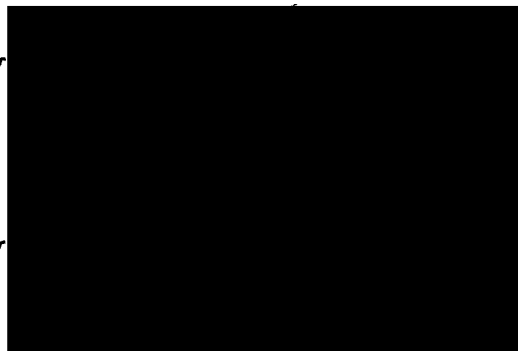
Approved By

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1 <u>INTRODUCTION</u>

This Engineering Change Proposal has been prepared to describe

the changes in scope requested to be included in the 70MM Data Block Reader

currently designed and developed by ███████████████████████ STATINTL

under ███████████████████████ STATINTL

New information concerning both the film format and the

reader's operational requirements arrived at ███ subsequent to the sub- STATINTL

mittal of proposal No. SME-CL-24, dated November 15, 1965. Evaluation

of this information rendered the original approach less efficient than was

originally calculated, and suggested a more suitable reading method.

Since it was impossible to change approaches later in the

contract period and still maintain the required quick reaction, the new

solution was immediately implemented into the design and fabrication of the

70MM Data Block Reader. However, ███ was contracted to perform in STATINTL

accordance with proposal No. SME-CL-24, which comprises part of the

contract, and the improvements that were incorporated in the design

constitute a change in scope and require the additional funds requested in

this Engineering Change Proposal.

2   ADDITIONAL TASKS

The following paragraphs describe the additional tasks to be

incorporated in the 70MM Data Block Reader under this Engineering Change

Proposal.

2. 1   WANDER CORRECTION

Drawings showing the laydown mechanism of the data block

indicate that the format and the data block are recorded in two different

stations, resulting in format wander of .046" independent of block wander

of the same amount. In addition, a static error of .030" in block location

may occur due to mask positioning tolerances. As a result, the data block

may fall partially into the format, or partially out of the film edge.

In most cases, however, only one of the variables - block and

format - is recorded in its worst wander condition, or they may both wander

in the same direction. For example:

a)   The block is recorded in its nominal position, or above it,

but the format has wandered to its uppermost position. The

dots do not fall in the format.

b)   The block is recorded in its lowest position, but so is the

format. Again, the dots are not in the format.

The original approach called for fixed, wide diodes, as the

reading elements. If these diodes are made wide enough to cover the block's

worst case wander, the lower diode will protrude into the format in example

(a), mistake it for a dot and perform an erroneous reading. If the diodes

are made narrower, so that they skirt the edge of the format's uppermost

position, the block in condition (b) will be missed, since the index dots

will be below the edge of the lower diodes.

Other examples involve an ambiguous strip between the two

rows of dots, where the upper row may be sensed by a lower diode (and

vice-versa) if the gap between the diodes is narrow, or a dot may fall into

a gap between two diodes and be missed altogether if that gap is wide.

Under the proposed change, the read heads will consist of

14 diodes .018" each. The leading head will sense the position of the dots

in the upper row, and based upon this information, the logic will activate

only the diodes that are located around the _actual_ position of the rows in

the data block. A group of adjacent activated diodes will effectively

perform as a single wide diode, similar to that in the original proposal,

except that by pre-sensing and switching the outputs of the diodes into variable clusters, the heads will effectively float up and down together with the data rows.

The basic difference between the two reading methods is that rather than opening a wide aperture to accommodate for maximum data block wander as originally proposed, the new approach will let the nominal size aperture wander together with the block. This solution requires 24 additional read amplifiers and the associated sensing and switching logic. It is also the major cause for increased reading reliability and lower error rate.

2.2   OPERATOR EFFICIENCY

To increase the operator's efficiency, it was requested that the following modifications be made in the transport design.

a)   The operator will control the reader from a sitting position. This requires mounting the film transport on a vertical plate rather than a table top base, as well as an optical assembly consisting of two lenses and a beam splitter to project the block image to the operator's eye level.

b)   Addition of manual cranks on the film reels to enable

manual transportation of the film.

c)   Addition of facility to stop the film before the next frame.

This required addition of heavy duty brakes on the film

reels.

d)   Automatic stopping on detected errors.